## Space Weather Forecast

Issued on Sunday, 09 July 2023 at 13:07 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Chance of R1/R2 Radio Blackouts throughout. Chance of G1/Minor storms Day 4 (12 July).**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity has been Low, with only isolated Common-class flares observed in the past 24 hours. There are currently 10 sunspot regions on the visible disc. The region near north centre disc remains the most magnetically complex region, with magnetic complexity visible within the trailing spots. A region in the southeast is the largest region on the disc, and consists of one very large spot and a weak trailing spot. The other regions appear mostly small and simple or stable at this stage. No Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery during the past 24 hours.

**Solar Wind / Geomagnetic Activity:** The solar wind showed a gradual declining trend through the last 24 hours. Wind speed was at slightly elevated levels, peaking at around 440 km/s, gradually declining to slow-ambient levels, currently near 350 km/s. Total magnetic field strength has been weak throughout, with the north-south component also varying weakly. Geomagnetic activity has been Quiet (Kp 0-1).

**Energetic Particles / Solar Radiation:** No solar radiation storms were observed.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** A continuation of Low activity is most likely, but with a chance of Moderate-class flares.

**Solar Wind / Geomagnetic Activity:** No Earth directed CMEs are currently expected. The solar wind speed is expected to be near ambient, or perhaps slightly elevated, levels through much of this period. A coronal hole fast wind is likely to arrive either on Day 4 (12 July), or just after the end of this period.

Geomagnetic activity is forecast to be mostly Quiet to Unsettled, but with an increasing risk of G1/Minor storms during Day 4 and a slight chance of an isolated G2/Moderate storm interval.

**Energetic Particles / Solar Radiation:** Solar radiation has a slight chance of reaching the S1/Minor Storm threshold through the period, should any larger flares occur.

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Met Office

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 1 | 1 | 1 | 40 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 40 | 40 | 40 | 40 |
| Very Active | R3 to R5 X | No | 5 | 5 | 5 | 5 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 5 | 5 | 5 | 5 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |
| * S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$) | | | | | | |

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